

WHAT IS CLAIMED IS:

1 1. A mask for manufacturing integrated circuits, the mask comprising:
2 a mask substrate;
3 an active mask region within a first portion of the mask substrate, the active
4 region being adapted to accumulate a pre-determined level of static electricity;
5 a first guard ring structure surrounding a portion of the active mask region to
6 isolate the active region from an outer region of the mask substrate; and
7 a second guard ring structure having at least one fuse structure surrounding a
8 portion of the first guard ring structure;
9 wherein the fuse structure is operably coupled to the active region to absorb a
10 current from static electricity, the static electricity being accumulated by the active region to
11 the pre-determined level and being discharged as current to the fuse structure while
12 maintaining the active region free from damage from the static electricity.

1 2. The mask of claim 1 wherein the fuse structure is a plurality of
2 conductive regions.

1 3. The mask of claim 1 wherein the fuse structure has a length and a
2 thickness.

1 4. The mask of claim 1 wherein the fuse structure is made of a conductive
2 material.

1 5. The mask of claim 1 wherein each of the fuse structures is formed on
2 the mask substrate within a predetermined distance from a portion of the active region such
3 that static electricity discharges to the fuse structure.

1 6. The mask of claim 1 wherein the fuse structure includes a plurality of
2 conductive members, each of the conductive members including an elongated portion
3 including a free end portion.

1 7. The mask of claim 1 wherein the first guard ring structure comprises a
2 trench region free from an overlying conductive layer.

1 8. The mask of claim 1 wherein the first guard ring structure is
2 continuous around the active region to electrically and physically isolate the second guard
3 ring structure from the active region.

1 9. The mask of claim 1 wherein the predetermined level corresponds to a
2 voltage no greater than 2,000,000 volts.

1 10. The mask of claim 1 wherein the predetermined level corresponds to a
2 voltage no greater than 2,000,000 volts.

1 11. A method for manufacturing a semiconductor integrated circuit device
2 structure comprising:

3 using a mask substrate, the mask substrate comprising:

4 an active mask region within a first portion of the mask substrate, the
5 active region being adapted to accumulate a pre-determined level of static electricity;

6 a first guard ring structure surrounding a portion of the active mask
7 region to isolate the active region from an outer region of the mask substrate; and

8 a second guard ring structure having at least one fuse structure
9 surrounding a portion of the first guard ring structure; the fuse structure being
10 operably coupled to the active region to absorb a current from static electricity, the
11 static electricity being accumulated by the active region to the pre-determined level
12 and being discharged as current to the fuse structure while maintaining the active
13 region free from damage from the static electricity.

1 12. The method of claim 11 wherein the fuse structure is a plurality of
2 conductive regions.

1 13. The method of claim 11 wherein the fuse structures is formed on the
2 mask substrate within a predetermined distance from a portion of the active region such that
3 static electricity discharges to the fuse structure.

1 14. The method of claim 11 the first guard ring structure is continuous
2 around the active region to electrically and physically isolate the second guard ring structure
3 from the active region.

1 15. The method of claim 11 wherein the fuse structure includes a plurality
2 of conductive members, each of the conductive members including an elongated portion
3 including a free end portion.

1 16. The method of claim 11 wherein each of the fuse structures is formed
2 on the mask substrate within a predetermined distance from a portion of the active region
3 such that static electricity discharges to the fuse structure.

1 17. A method for manufacturing integrated circuit devices, the method
2 comprising:
3 receiving a mask in a first pod, the mask including an active region and a
4 guard ring structure having at least one fuse structure;
5 transferring the mask from the first pod into a second pod within a clean room
6 environment;
7 handling the mask in the clean room environment;
8 accumulating static electricity on the mask during the handling in the clean
9 room environment;
10 discharging a portion of the static charge to the fuse on the guard ring structure
11 of the mask while maintaining the active region of the mask free from static energy damage;
12 and
13 using the mask in an operation for manufacture of semiconductor integrated
14 circuits.

1 18. The method of claim 17 wherein the operation is a lithography process.

1 19. The method of claim 17 wherein the static energy is characterized by a
2 voltage of 1000 volts.

1 20. The method of claim 17 wherein the static energy is characterized by a
2 voltage of greater than 3000 volts.